

CLAIMS

What is claimed as being new and desired to be protected by LETTERS PATENT of the United States is as follows:

1. A pressurized sanitary precision polymer film casting and dispersion injection system for creating individual containers of particulate material in a safe and economical manner comprising, in combination:

a container of a polymer having a first volume, the polymer being solid at a first, ambient temperature and flowable at a second, heated temperature, the container having a first height and a first diameter;

an output master supply assembly having a first control panel, the assembly having a horizontal base for the receipt of a container of polymer film material and a plurality of vertical telescoping cylinders, a pair of cross members coupling with the vertical cylinders for maintaining the vertical cylinders in alignment, the supply assembly having a drive subassembly, the drive subassembly having an upper platform being fixedly coupled to the cross members and located a second distance from the horizontal base, with the second distance being greater than the first height, a pressure source being coupled to upper platform, the drive subassembly having a plurality of thrust shafts with the thrust shafts slidably coupled to the cross members, the pressure source providing an upward and a downward movement of

the vertical telescoping cylinders and the thrust shafts, the drive subassembly also having a platen, the platen being disposed beneath the upper platform with the platen being coupled to the thrust shafts and being moveable in an upward and a downward direction relative to the platform, the platen having a generally round disk shape having a second diameter, the second diameter being less than the first diameter, the platen comprising an upper portion having a flat upper surface and a recessed lower surface having a heating component there within and lower portion having a flat upper surface and a concave lower surface, the platen having a thickness forming an edge and having an O-ring coupled there to, the platen having a centrally located hole there through from the upper surface of the upper portion to the lower surface of the lower portion to provide a passageway there through, the platen having an electrical coupling to provide energy to the heating element there within and an outflow coupling located on the upper surface with the coupling communicating with the passageway through the platen, the motor of the subassembly moving the platen downward against the polymer in the container to generate a pressure within the first container;

a dual gear, single outlet material pump comprising a rectilinear base plate having an upper surface and a lower surface with a side edge having a thickness there between with

the base plate having an inflow opening there through, the upper surface of the base plate having a plurality of pin recesses and threaded screw recesses and bearing recesses there in, a lower gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the lower gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the lower gear plate having an outlet on the edge, the outlet communicating with the tri-lobed aperture, the pump having an idler shaft and a drive shaft, each shaft having a fifth external diameter, with the idler shaft having an associated upper and lower bearing and the drive shaft having an associated upper and lower bearing, the pump having a pair of lower gears with each having a shaft hole there through, the gears being a drive gear and an idler gear, each gear having a fourth diameter, the fourth diameter being slightly less than the third diameter with the fifth diameter being less than the fourth, each of the gears being housed within the tri-lobed aperture of the lower gear plate, a seal being located between the base plate and the lower gear plate, a pair of alignment pins, a spacer plate having a plurality of pin holes and shaft holes and a material flow hole and bolt holes there through and a plurality of temperature sensor recesses there into, a seal located between the lower gear plate and the spacer plate, with the idler shaft passing through

a shaft hole in the spacer plate and the shaft hole of the lower gear plate and the drive shaft passing through a shaft hole in the spacer plate and the shaft hole of the lower drive gear, an upper gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the upper gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the upper gear plate having an outlet on the edge, the outlet communicating with the tri-lobed aperture, a pair of upper gears with each gear having an external fourth diameter and a shaft hole there through, the shaft hole having a fifth diameter, the gears being a drive gear which is coupled to the drive shaft and an idler gear which is coupled to the idler shaft, the gears being housed within the tri-lobed aperture of the upper gear plate, a top plate having an upper surface and a lower surface with a side edge having a thickness there between, the lower surface of the top plate having a plurality of pin recesses and bearing recesses there in, the top plate also having a plurality of screw holes there through, a seal being positioned between the top plate and the upper gear plate, a plurality of heating plates being coupled to the sides of the assembled pump to provide heat to the pump and the material as it passes through the pump, a plurality of temperature sensors coupled to the temperature sensor recesses, the pump drive shaft being sized to pass through

the drive gears and plates and to be received by an upper and lower bearing, and the pump also having a plurality of bolts to couple the plates to each other, the pump coupled to the platen outflow coupling and being positioned to receive material from the container, the pump having an outlet plate for coupling with each of the outlets of the lower gear plate and the upper gear plate to form a single outlet, the pump taking in polymer and outputting the same polymer under a second pressure;

a primary feed hose having an inflow end and an outflow end with the hose being coupled with a clamp on the inflow end to outlet of the dual geared single outlet material pump, the hose having a central pathway there through to allow the passage of material through the hose, the hose having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a power source by a wire, the hose having a pair of hollow tubular fittings, with the fittings having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

a secondary container of a polymer having a second volume with the second volume being substantially less than the first volume, the polymer being solid at a first, ambient temperature and flowable at a second, heated temperature, the container

having a second height and a fifth diameter, the second container being coupled with a clamp to the outflow end of the primary feed hose;

an intermediate output supply assembly having a second control panel, the assembly having a horizontal base for the receipt of a container of polymer film material, and a plurality of vertical telescoping cylinders, a cross member coupling with the vertical telescoping cylinders for maintaining the vertical cylinders in alignment, the supply assembly having a drive subassembly, the drive subassembly having a pressure source providing a pressure force to the vertical cylinders, the pressure source being coupled to the cross member, the drive subassembly having at least one thrust shaft coupled to the cross member, the pressure source providing a pressure force to the cylinders and thereby providing an upward and downward movement of the thrust shaft, the drive subassembly also having a platen, the platen being coupled to the thrust shaft and being moveable in a upward and downward direction, the platen having a generally round disk shape having a sixth diameter, the sixth diameter being less than the fifth diameter, the platen comprising an upper portion having a flat upper surface and a recessed lower surface having a heating component there within and lower portion having a flat upper surface and a concave lower surface, the platen having a thickness forming an edge and having an O-ring

coupled there to, the platen having a centrally located hole there through from the upper surface of the upper portion to the lower surface of the lower portion to provide a passageway there through, the platen having an electrical coupling to provide energy to the heating element there within and an outflow coupling located on the upper surface and communicating with the passageway through the platen, the pressure source of the subassembly moving the platen downward against the polymer in the container thereby pressurizing the polymer to a first pressure;

a dual gear, dual outlet material pump comprising a rectilinear base plate having an upper surface and a lower surface with a side edge having a thickness there between with the base plate having an inflow opening there through, the upper surface of the base plate having a plurality of pin recesses and threaded screw recesses and bearing recesses there in, a lower gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the lower gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the lower gear plate having an outlet on the edge with an outlet stub coupled there to, the outlet communicating with the tri-lobed aperture, a pair of lower gears being a drive gear and an idler gear, each having a fourth diameter, the fourth diameter being slightly less than the third diameter, the gears each having an

associated gear bearing and each being housed within the tri-lobed aperture of the lower gear plate, each of the gears having a shaft hole there through, a seal being located between the base plate and the lower gear plate, a pair of alignment pins, a spacer plate having a plurality of pin holes and shaft holes and a material flow hole and bolt holes there through and a plurality of temperature sensor recesses there into, a seal located between the lower gear plate and the spacer plate with an idler shaft passing through a shaft hole in the spacer plate and the shaft hole of the lower idler gear, an upper gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the upper gear plate having a tri-lobed aperture located there through with each of the lobes having a third diameter, the upper gear plate having an outlet on the edge with an outlet stub coupled there to, the outlet communicating with the tri-lobed aperture, a pair of upper gears being a drive gear and an idler gear, each gear having a fourth diameter, the fourth diameter being slightly less than the third diameter, the gears each having an associated gear bearing and each being housed within the tri-lobed aperture of the upper gear plate, each of the gears having a shaft hole there through, a top plate having an upper surface and a lower surface with a side edge having a thickness there between, the lower surface of the top plate having a

plurality of pin recesses and bearing recesses there in, the top plate also having a plurality of screw holes there through and a drive shaft hole there through, with a drive shaft having an associated seal retainer, the drive shaft sized to pass through the drive gears and plates and to be received by a bearing, a seal being positioned between the top plate and the upper gear plate, a plurality of heating plates being coupled to the sides of the assembled pump to provide heat to the pump and the material as it passes through the pump, a plurality of temperature sensors coupled to the temperature sensor recesses, the pump also having a plurality of bolts to couple the plates to each other, the pump coupled to the platen hole and being positioned to receive material from the container thereby outputting the material at a second pressure;

a pair of secondary feed hoses each having an inflow end and an outflow end with the inflow end of each hose being coupled with a clamp to the one of the outlets of the dual geared dual outlet material pump, each of the hoses having a central pathway there through to allow the passage of material through the hose, each of the hoses having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a power source by a wire, each of the hoses having a pair of hollow tubular fittings, with the fittings

having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

a pair of filters each having an inlet and an outlet with each filter having a plurality of filter elements associated there with, the inlet and outlet each having an associated cone shaped connector being coupled to the filter body, the filter body being centrally located and having associated O-rings, the inlet of each of the filters being coupled with a clamp to the outflow end of each of the secondary feed hoses;

a pair of injection valves with each valve having a material inflow end with a material inflow aperture being coupled to the outlet of a filter and the inflow end having an outflow aperture having a seventh diameter, each valve having a pressurized end with a pressure inflow aperture and a pressure cavity, the pressure cavity having a piston subassembly, the inflow end of the injection valve having a valve subassembly there within, the valve subassembly comprising a valve pin with a head having an eighth diameter with the eighth diameter being slightly smaller than the seventh diameter, the pin sized to block the outflow aperture, the valve pin having an associated spring and pin contact shaft, the inflow end of the injection valve being separated from the pressurized end of the injection valve by a diaphragm, the piston subassembly having a piston and an

associated piston shaft and a plurality of associated O-rings, the piston shaft contacting the valve pin contact shaft and when a third pressure is introduced into the pressurized end the piston being moved toward the inflow end of the injection valve and the movement thereby effectuating the movement of the valve pin to an open position allowing material within the inflow end of the injection valve to move outward through the outflow aperture at a third pressure, when the pressure in the pressurized end of the injection valve drops the valve pin spring moves the valve pin to the closed position;

a third pressure source being coupled to the pressurized end of the injection valve;

a plurality of dies of similar configuration, each of the dies having a mounting plate and a distribution plate parallel with the mounting plate with the distribution plate having an upper edge with a material feed aperture for the receipt of liquid polymer, each die having a heater plate with an insulator dielectric plate between the heater and the mounting plate and a shim in an inverted U-shaped configuration adjacent to the distribution plate and an extrusion face between the shim and the heater, all die plates having a generally rectilinear configuration with an upper edge, a lower edge and side edges there between whereby polymer may be fed through the distribution plate there through the opening in the shim, each material feed

aperture of each die being coupled to an outflow aperture of an injection valve;

a polymer dispensing assembly having a control box and a motor, the assembly having a plurality of dies coupled there to, a pair of roller-conveyors rotatable about parallel axes with exterior surfaces of each of the roller conveyers being positioned immediately beneath the shim of each of the dies, the dispensing assembly having a pair of rotary dies, the rotary dies having axes parallel with each other and the axes of the rotary dies being located between the roller-conveyors, the rotary dies being in closely spaced relationship with each other with circumferential pressure surfaces, the polymer dispensing assembly having a positive displacement pumping device providing dial-in incremental, thermal and precise dosage control located above the rotary dies for the periodic dispensing of particulate materials between packets formed with the solidification of the polymer moving between the rotary dies; and

a master control panel coupling the output master supply assembly and dual gear, single outlet material pump and primary and secondary hoses and the intermediate output supply assembly and dual gear, dual outlet material pump and the polymer dispensing assembly for continuous and automatic control of the speed of the pump and the rate of rotation of the rollers and the heat of the tubes and the platen and the dies.

2. A polymer film casting and dispersion system comprising, in combination:

a first container of a polymer having a first volume;

an output master supply assembly having a control panel and a base and a plurality of vertical telescoping cylinders and a plurality of drive shafts and a pressure source, the assembly having a heated platen having a centrally located passageway there through with the motor moving the platen downward against the polymer in the container, the master supply assembly being coupled to the first container;

a pressure fed, heated, dual gear, single outlet material pump;

a heated primary feed hose having a radius beveled inlet;

a second container of a polymer having a second volume;

an intermediate output supply assembly having a control panel and a horizontal base and a plurality of vertical telescoping cylinders and a pressure source and at least one thrust shaft, the assembly also having a platen having a heating component, the platen having a centrally located hole there through, the intermediate output supply assembly being coupled to the second container of polymer;

a pressure fed, heated, dual gear, dual outlet material pump;

a pair of heated secondary hoses having a radius beveled inlet;

a pair of in-line filters;

a pair of injection valves each having an inflow end having a valve subassembly with a valve pin and an associated spring and a pressurized end having a piston subassembly, the inflow end being separated from the pressurized end by a diaphragm;

a pressure source being coupled to the pressurized end of the injection valve;

a plurality of dies each having a heater plate;

a polymer dispensing assembly having a control box and a motor and a plurality of dies and a pair of roller conveyors and a pair of rotary dies and a positive displacement pumping device; and

a master control panel coupling each element to control the movement of material through the system.

3. A precision polymer film casting and injection system comprising, in combination:

a container of a polymer having a first volume;

an output master supply assembly having a control panel and a horizontal base and a plurality of vertical telescoping cylinders and a pair of cross members and an upper platform and a pressure source and a plurality of drive shafts and a platen, the platen being moveable in a upward and downward direction, the

platen having a generally round disk shape having a heating component there within, the platen having a centrally located hole there through to form a passageway there through and producing a first pressure within the polymer;

a pressure fed, heated, dual gear, single outlet material pump comprising a rectilinear base plate and a lower gear plate and a pair of lower gears being a drive gear and an idler gear and a spacer plate and an upper gear plate and a pair of upper gears being a drive gear and an idler gear and a plurality of heating plates and a plurality of temperature sensors, the pump coupled to the platen and producing a second pressure;

a heated primary feed hose having an inflow end and an outflow end, the hose having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a heating source by a wire, the fittings having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

a second container of a polymer having a second volume;

an intermediate output supply assembly having a control panel and a base and a plurality of vertical telescoping cylinders, and a motor providing a pressure force and a thrust shaft, the assembly having a platen, the platen being coupled to

the thrust shaft, the platen having a heating component there within and producing a first pressure within the polymer;

a pressure fed, heated, dual gear, dual outlet material pump comprising a rectilinear base plate and a lower gear plate and a pair of lower gears being a drive gear and an idler gear and a spacer plate and an upper gear plate and a pair of upper gears being a drive gear and an idler gear and a plurality of heating plates and a plurality of temperature sensors, the pump producing a second pressure;

a pair of heated secondary feed hoses, each hose having an inflow end and an outflow end, each hose having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a heating source by a wire, the fittings having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

a pair of injection valves with each valve having a material inflow end with a material inflow aperture and a pressurized end with a pressure inflow aperture and a pressure cavity, the pressure cavity having a piston subassembly, the inflow end of the injection valve having a valve subassembly there within, the valve subassembly comprising a valve pin with a head the pin

having an associated spring and pin contact shaft, the inflow end of the injection valve being separated from the pressurized end of the injection valve by a diaphragm, the piston subassembly having a piston and an associated piston shaft contacting the valve pin contact shaft, the injection valve producing a third pressure;

a third pressure source being coupled to the pressurized end of the injection valve;

a plurality of dies of similar configuration, each of the dies having a mounting plate and a distribution plate, each die having a heater plate and a shim;

a polymer dispensing assembly having a control box and a motor, the assembly having a plurality of dies and a pair of roller-conveyors and a pair of rotary dies, the polymer dispensing assembly having a positive displacement pumping device; and

a master control panel coupling the output master supply assembly and dual gear, single outlet material pump and primary and secondary hoses and the intermediate output supply assembly and dual gear, dual outlet material pump and the polymer dispensing assembly for continuous and automatic control of the speed of the pump and the rate of rotation of the rollers and the heat of the tubes and the platen and the dies.

4. A polymer film casting and dispersion system as described in Claim 3 wherein the platen has a plurality of downwardly projecting fins.

5. A method of constructing a sanitary precision polymer film casting and dispersion injection system for creating individual containers of particulate material in a safe and economical manner comprising, in combination:

providing a container of a polymer having a first volume, the polymer being solid at a first, ambient temperature and flowable at a second, heated temperature, the container having a first height and a first diameter;

providing an output master supply assembly having a first control panel, the assembly having a horizontal base for the receipt of a container of polymer film material and a plurality of vertical telescoping cylinders, a pair of cross members coupling with the vertical cylinders for maintaining the vertical cylinders in alignment, the supply assembly having a drive subassembly, the drive subassembly having an upper platform being fixedly coupled to the cross members and located a second distance from the horizontal base, with the second distance being greater than the first height, a pressure source being coupled to upper platform, the drive subassembly having a plurality of thrust shafts with the thrust shafts slidably coupled to the cross members, the pressure source providing an upward and a

downward movement of the vertical pressure cylinders and the thrust shafts, the drive subassembly also having a platen, the platen being disposed beneath the upper platform with the platen being coupled to the thrust shafts and being moveable in an upward and a downward direction relative to the platform, the platen having a generally round disk shape having a second diameter, the second diameter being less than the first diameter, the platen comprising an upper portion having a flat upper surface and a recessed lower surface having a heating component there within and lower portion having a flat upper surface and a concave lower surface, the platen having a thickness forming an edge and having an O-ring coupled there to, the platen having a centrally located hole there through from the upper surface of the upper portion to the lower surface of the lower portion to provide a passageway there through, the platen having an electrical coupling to provide energy to the heating element there within and an outflow coupling located on the upper surface with the coupling communicating with the passageway through the platen, the motor of the subassembly moving the platen downward against the polymer in the container thereby producing a first pressure within the polymer;

providing a dual gear, single outlet material pump comprising a rectilinear base plate having an upper surface and a lower surface with a side edge having a thickness there between

with the base plate having an inflow opening there through, the upper surface of the base plate having a plurality of pin recesses and threaded screw recesses and bearing recesses there in, a lower gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the lower gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the lower gear plate having an outlet on the edge, the outlet communicating with the tri-lobed aperture, the pump having an idler shaft and a drive shaft, each shaft having a fifth external diameter, with the idler shaft having an associated upper and lower bearing and the drive shaft having an associated upper and lower bearing, the pump having a pair of lower gears with each having a shaft hole there through, the gears being a drive gear and an idler gear, each gear having a fourth diameter, the fourth diameter being slightly less than the third diameter with the fifth diameter being less than the fourth, each of the gears being housed within the tri-lobed aperture of the lower gear plate, a seal being located between the base plate and the lower gear plate, a pair of alignment pins, a spacer plate having a plurality of pin holes and shaft holes and a material flow hole and bolt holes there through and a plurality of temperature sensor recesses there into, a seal located between the lower gear plate and the spacer plate, with the idler shaft passing through

a shaft hole in the spacer plate and the shaft hole of the lower idler gear and the drive shaft passing through a shaft hole in the spacer plate and the shaft hole of the lower drive gear, an upper gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the upper gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the upper gear plate having an outlet on the edge, the outlet communicating with the tri-lobed aperture, a pair of upper gears with each gear having an external fourth diameter and a shaft hole there through, the shaft hole having a fifth diameter, the gears being a drive gear which is coupled to the drive shaft and an idler gear which is coupled to the idler shaft, the gears being housed within the tri-lobed aperture of the upper gear plate, a top plate having an upper surface and a lower surface with a side edge having a thickness there between, the lower surface of the top plate having a plurality of pin recesses and bearing recesses there in, the top plate also having a plurality of screw holes there through, a seal being positioned between the top plate and the upper gear plate, a plurality of heating plates being coupled to the sides of the assembled pump to provide heat to the pump and the material as it passes through the pump, a plurality of temperature sensors coupled to the temperature sensor recesses, the pump drive shaft being sized to pass through

the drive gears and plates and to be received by an upper and lower bearing, and the pump also having a plurality of bolts to couple the plates to each other, the pump coupled to the platen outflow coupling and being positioned to receive material from the container, the pump having an outlet plate for coupling with each of the outlets of the lower gear plate and the upper gear plate to form a single outlet, the pump producing a second pressure within the polymer;

providing a primary feed hose having an inflow end and an outflow end with the hose being coupled with a clamp on the inflow end to outlet of the dual geared single outlet material pump, the hose having a central pathway there through to allow the passage of material through the hose, the hose having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a power source by a wire, the hose having a pair of hollow tubular fittings, with the fittings having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

providing a secondary container of a polymer having a second volume with the second volume being substantially less than the first volume, the polymer being solid at a first, ambient

temperature and flowable at a second, heated temperature, the container having a second height and a fifth diameter, the second container being coupled with a clamp to the outflow end of the primary feed hose;

providing an intermediate output supply assembly having a second control panel, the assembly having a horizontal base for the receipt of a container of polymer film material, and a plurality of vertical telescoping cylinders, a cross member coupling with the vertical telescoping cylinders for maintaining the vertical cylinders in alignment, the supply assembly having a drive subassembly, the drive subassembly having a motor providing a pressure force to the vertical cylinders, the pressure source being coupled to the cross member, the drive subassembly having at least one thrust shaft coupled to the cross member, the pressure source providing a pressure force to the telescoping cylinders and thereby providing an upward and downward movement of the thrust shaft, the drive subassembly also having a platen, the platen being coupled to the thrust shaft and being moveable in a upward and downward direction, the platen having a generally round disk shape having a sixth diameter, the sixth diameter being less than the fifth diameter, the platen comprising an upper portion having a flat upper surface and a recessed lower surface having a heating component there within and lower portion having a flat upper surface and a concave lower surface, the

platen having a thickness forming an edge and having an O-ring coupled there to, the platen having a centrally located hole there through from the upper surface of the upper portion to the lower surface of the lower portion to provide a passageway there through, the platen having an electrical coupling to provide energy to the heating element there within and an outflow coupling located on the upper surface and communicating with the passageway through the platen, the motor of the subassembly moving the platen downward against the polymer in the container producing a first pressure;

providing a dual gear, dual outlet material pump comprising a rectilinear base plate having an upper surface and a lower surface with a side edge having a thickness there between with the base plate having an inflow opening there through, the upper surface of the base plate having a plurality of pin recesses and threaded screw recesses and bearing recesses there in, a lower gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the lower gear plate having a tri-lobed aperture there through with each of the lobes having a third diameter, the lower gear plate having an outlet on the edge with an outlet stub coupled there to, the outlet communicating with the tri-lobed aperture, a pair of lower gears being a drive gear and an idler gear, each having a fourth diameter, the fourth diameter being

slightly less than the third diameter, the gears each having an associated gear bearing and each being housed within the tri-lobed aperture of the lower gear plate, each of the gears having a shaft hole there through, a seal being located between the base plate and the lower gear plate, a pair of alignment pins, a spacer plate having a plurality of pin holes and shaft holes and a material flow hole and bolt holes there through and a plurality of temperature sensor recesses there into, a seal located between the lower gear plate and the spacer plate with an idler shaft passing through a shaft hole in the spacer plate and the shaft hole of the lower idler gear, an upper gear plate having a rectilinear configuration with an upper surface and a lower surface with a side edge having a thickness there between, the upper gear plate having a tri-lobed aperture located there through with each of the lobes having a third diameter, the upper gear plate having an outlet on the edge with an outlet stub coupled there to, the outlet communicating with the tri-lobed aperture, a pair of upper gears being a drive gear and an idler gear, each gear having a fourth diameter, the fourth diameter being slightly less than the third diameter, the gears each having an associated gear bearing and each being housed within the tri-lobed aperture of the upper gear plate, each of the gears having a shaft hole there through, a top plate having an upper surface and a lower surface with a side edge having a thickness

there between, the lower surface of the top plate having a plurality of pin recesses and bearing recesses there in, the top plate also having a plurality of screw holes there through and a drive shaft hole there through, with a drive shaft having an associated seal retainer, the drive shaft sized to pass through the drive gears and plates and to be received by a bearing, a seal being positioned between the top plate and the upper gear plate, a plurality of heating plates being coupled to the sides of the assembled pump to provide heat to the pump and the material as it passes through the pump, a plurality of temperature sensors coupled to the temperature sensor recesses, the pump also having a plurality of bolts to couple the plates to each other, the pump coupled to the platen hole and being positioned to receive material from the container, the pump producing a second pressure within the polymer;

providing a pair of secondary feed hoses each having an inflow end and an outflow end with the inflow end of each hose being coupled with a clamp to the one of the outlets of the dual geared dual outlet material pump, each of the hoses having a central pathway there through to allow the passage of material through the hose, each of the hoses having an inner layer forming a smooth inner surface of the hose pathway and an armored crush-resistant outer layer and a heating layer disposed there between, the heating layer coupled to a power source by a wire, each of

the hoses having a pair of hollow tubular fittings, with the fittings having a smooth inner surface having a radius beveled inlet to reduce the area of diminished flow within the hose and a stepped outer surface to provide a gripping surface thereto;

providing a pair of filters each having an inlet and an outlet with each filter having a plurality of filter elements associated there with, the inlet and outlet each having an associated cone shaped connector being coupled to the filter body, the filter body being centrally located and having associated O-rings, the inlet of each of the filters being coupled with a clamp to the outflow end of each of the secondary feed hoses;

providing a pair of injection valves with each valve having a material inflow end with a material inflow aperture being coupled to the outlet of a filter and the inflow end having an outflow aperture having a seventh diameter, each valve having a pressurized end with a pressure inflow aperture and a pressure cavity, the pressure cavity having a piston subassembly, the inflow end of the injection valve having a valve subassembly there within, the valve subassembly comprising a valve pin with a head having an eighth diameter with the eighth diameter being slightly smaller than the seventh diameter, the pin sized to block the outflow aperture, the valve pin having an associated spring and pin contact shaft, the inflow end of the injection

valve being separated from the pressurized end of the injection valve by a diaphragm, the piston subassembly having a piston and an associated piston shaft and a plurality of associated O-rings, the piston shaft contacting the valve pin contact shaft and when pressure is introduced into the pressurized end the piston being moved toward the inflow end of the injection valve and the movement thereby effectuating the movement of the valve pin to an open position allowing material within the inflow end of the injection valve to move outward through the outflow aperture, when the pressure in the pressurized end of the injection valve drops the valve pin spring moves the valve pin to the closed position, the valve producing a third pressure within the polymer;

providing a third pressure source being coupled to the pressurized end of the injection valve;

providing a plurality of dies of similar configuration, each of the dies having a mounting plate and a distribution plate parallel with the mounting plate with the distribution plate having an upper edge with a material feed aperture for the receipt of liquid polymer, each die having a heater plate with an insulator dielectric plate between the heater and the mounting plate and a shim in an inverted U-shaped configuration adjacent to the distribution plate and an extrusion face between the shim and the heater, all die plates having a generally rectilinear

configuration with an upper edge, a lower edge and side edges there between whereby polymer may be fed through the distribution plate there through the opening in the shim, each material feed aperture of each die being coupled to an outflow aperture of an injection valve;

providing a polymer dispensing assembly having a control box and a motor, the assembly having a plurality of dies coupled there to, a pair of roller-conveyors rotatable about parallel axes with exterior surfaces of each of the roller-conveyers being positioned immediately beneath the shim of each of the dies, the dispensing assembly having a pair of rotary dies, the rotary dies having axes parallel with each other and the axes of the rotary dies being located between the roller-conveyors, the rotary dies being in closely spaced relationship with each other with circumferential pressure surfaces, the polymer dispensing assembly having a positive displacement pumping device providing dial-in incremental, thermal and precise dosage control located above the rotary dies for the periodic dispensing of particulate materials between packets formed with the solidification of the polymer moving between the rotary dies; and

coupling, through a master control panel, the output master supply assembly and dual gear, single outlet material pump and primary and secondary hoses and the intermediate output supply assembly and dual gear, dual outlet material pump and the polymer

dispensing assembly, whereby the user has continuous and automatic control of the speed of the pump and the rate of rotation of the rollers and the heat of the tubes and the platen and the dies.

6. A method of constructing a polymer film injection system comprising, in combination:

providing a container of a polymer material to be utilized;

providing an output master supply assembly having a first control panel, a horizontal base, vertical telescoping cylinders, a pressure source coupled to the cylinders and a platen having a heating component whereby the polymer material may be introduced into the system;

providing at least one dual gear, material pump comprising a base plate and a lower gear plate and at least one shaft and at least one pair of gears and a top plate, the pump coupled to the platen whereby the material received from the master supply assembly may be pressurized and pumped;

providing at least one feed hose having a central pathway there through to carry the material from the pump;

providing at least one filter having a plurality of filter elements associated there with, the filter being coupled to and associated with a feed line;

providing at least one injection valve having a material inflow end with a material inflow aperture and an outflow

aperture and a valve subassembly, the valve having a pressurized end with a pressure inflow aperture and a pressure cavity with a piston subassembly, the valve receiving material from the pump and the valve being actuated by pressure;

providing a pressure source to the injection valve;

providing at least one die for the receipt of liquid polymer from the valve;

providing a polymer dispensing assembly having a control box and a motor and at least one die and a pair of roller-conveyors and a pair of rotary dies; and

coupling through providing a master control panel, the components of the system, whereby the user has continuous and automatic control of the speed of the pump and the rate of rotation of the rollers and the heat of the tubes and the platen and the dies to effectuate precision control of the extrusion of the polymer.